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MORBIDITY AND MORTALITY WEEKLY REPORT

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Epidemiologic Notes and Reports

Human Immunodeficiency Virus Infection in Transfusion Recipients and Their Family Members

CDC has received a report of human immunodeficiency virus (HIV) infection among multiply-transfused leukemia patients in New York City. In addition, there have been several reports that persons with transfusion-associated HIV infection have transmitted the virus to their sexual partners and newborn children. All infected transfusion recipients described in these reports had received blood or blood components before routine screening of donated blood for HIV antibody was begun in the spring of 1985.

Multiply-Transfused Leukemia Patients

During the past year, four long-term leukemia survivors at Memorial Sloan-Kettering Cancer Center in New York City developed unexplained fever, weight loss, diarrhea, or lymphadenopathy. They subsequently had positive serological tests for HIV antibody. A retrospective study of other multiply-transfused leukemia patients was conducted to determine how many had been infected with HIV. Informed consent was obtained from all living patients. Positive enzyme immunoassay (EIA) tests were confirmed by Western blot assay. Patients known to have other risk factors for HIV infection were excluded from the study.

Sera were located for 182 deceased and obtained from 22 surviving leukemia patients treated during the years 1978-1986. Sixteen of these transfusion recipients were seropositive for HIV antibody (Table 1). They had received a mean of 27 units of packed red blood

TABLE 1. HIV serology results in leukemia patients, by year of specimen collection — Memorial Sloan-Kettering Cancer Center, New York City

Years	Total number of patients tested	Number with positive test	Estimated* risk per component
1978-80	86 (55M,31F) [†]	0 (0%)	0.00%
1981-83	77 (39M,38F)	9 (12%) (6M,3F)	0.07%
1984-86 [‡]	41 (21M,20F)	7 (17%) (2M,5F)	0.10%
Total	204 (115M,89F)	16 (8%) (8M,8F)	0.05%

*Estimated risk based on an average of 164 components per recipient.

[†]M=males; F=females.

[‡]These patients were treated before screening of blood products began in March 1985; 22 long-term survivors, four of whom were seropositive, are included.

HIV Infection — Continued

cells (range 2-56) and 137 units of platelets (range 10-483). Forty-five percent of these 204 patients had acute myelogenous leukemia; 20% had acute lymphocytic leukemia; 13%, chronic myelogenous leukemia; 4%, chronic lymphocytic leukemia; 6%, myelodysplastic syndromes; and 12%, other or unclassified leukemias. There was no correlation between type of leukemia and the presence of HIV antibody. An additional 23 newly diagnosed, untreated, and untransfused leukemia patients were tested and all were seronegative.

Additional Case Reports From Other Areas

Case 1: An elderly man with no known risk for AIDS received multiple units of blood in early 1982, including one from a donor who subsequently tested positive for HIV antibody. The recipient developed *Pneumocystis carinii* pneumonia (PCP) in 1983 and died in 1984. His wife, who did not have any other risk factors for AIDS, had had vaginal intercourse with him until he became ill in late 1982. In late 1984, her HIV antibody test was positive and she was diagnosed as having a type of lymphoma indicative of AIDS (1).

Case 2: A pregnant woman with no other risk factors for AIDS received four units of blood in 1978, including one from a donor who later tested positive for HIV antibody. A son, born in 1980, had failure to thrive beginning at 13 months of age and died with PCP in 1986. The woman, her son, her husband, and the child born shortly after the transfusion all tested positive for HIV antibody.

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Editorial Note: At present, prevention of HIV infection and AIDS is dependent upon deferral of blood or plasma donation by persons at increased risk for AIDS, testing of donated blood and plasma for HIV antibody, heat treatment of clotting factor concentrates, avoidance of unprotected sexual contact and needle sharing by persons infected with HIV, and prevention of perinatal transmission by infected women. Counseling and HIV antibody testing have been recommended for persons at risk for infection (including homosexual/bisexual men, intravenous drug abusers, hemophilia patients, prostitutes, and persons who have had sexual contact with members of these groups) (2). Routine counseling and antibody testing have not been recommended for blood transfusion recipients because, in general, their risk for infection is extremely low. However, as illustrated by this report and others (3), some multiply-transfused persons may be at a higher risk for HIV infection. In addition, some persons with transfusion-associated HIV infection have transmitted the virus to their sexual partners and, perinatally, to their infant children.

Although the number of infected transfusion recipients in the United States is unknown, it can be approximated using estimates of the prevalence of infection in donors, the efficiency of transmission, and the number of units transfused per year. In 1985, 0.04% of donations were positive for HIV antibody by Western blot assay (4). If 0.04% had been the seroprevalence among donors in the year prior to screening, if all seropositive units had transmitted infection (5), and if each seropositive unit had gone to a different recipient, then 7,200 of the approximately 18 million components transfused in 1984 (American Blood Commission, unpublished data) might have transmitted infection. If 60% of these recipients have died from

HIV Infection — Continued

their underlying disease (6), then approximately 2,900 living recipients who acquired a transfusion-associated HIV infection in 1984 would remain. Most of these would be asymptomatic. The number of infected donors was probably lower in earlier years. Mathematical projections from reported transfusion-associated AIDS cases estimate that approximately 12,000 people now living in the United States acquired a transfusion-associated HIV infection between 1978 and 1984 (7).

Blood banking organizations in the United States have begun "look-back" programs to identify previous recipients of blood from donors who tested positive for HIV antibody after screening began. In one region, 70% of recipients identified through such a program had HIV antibody (8). However, look-back programs cannot identify all infected transfusion recipients because many infected donors may have refrained from donating or become too ill to continue to donate after HIV serologic testing of donors began.

The risk of HIV transmission by transfusion was low, even before screening, and has been virtually eliminated by the routine screening of donated blood and plasma. However, since HIV-infected persons are at risk for developing AIDS or related conditions themselves and may transmit infection to others, physicians should consider offering HIV antibody testing to some patients who received transfusions between 1978 and late spring of 1985. This consideration should be based on the likelihood of infection in a recipient and the likelihood of transmission from that recipient. The risk of infection is greatest if the recipient received large numbers of transfusions and if the blood was collected during the few years before screening in an area with a high incidence of AIDS. (The leukemia patients in this report received many units of blood and blood components in an area with a higher prevalence of HIV than most parts of the United States, so their seropositivity rate is higher than would be expected in other patients. Conversely, persons who received a small number of units in a low prevalence area would have an extremely low risk of HIV infection.) Testing is particularly important if the patient is sexually active. Since the overall prevalence of infection in transfusion recipients is expected to be low, the positive predictive value of EIA screening tests for HIV antibody will be much lower than that seen when testing high-risk populations (9). Therefore, all transfusion recipients with a positive EIA should also have their serum tested by a second method (Western blot assay, immunofluorescence assay) before they are informed of their test result. Seropositive persons should be evaluated for signs and symptoms of AIDS or related conditions and counseled regarding the avoidance of HIV transmission to others.

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Current Trends**Smokeless Tobacco Use in Rural Alaska**

Reported rates of smokeless tobacco use have been consistently much lower for females than for males (1-8). Approximately 2% of females of all ages are estimated to have used smokeless tobacco in the last year (1). However, among American Indian/Alaskan Native (AI/AN) children, female and male usage rates are similar (9,10,11). In addition, the reported number of smokeless tobacco users in this population is substantially higher than in the general U.S. population of the same age (9,10,11).

Data from a 1986 Indian Health Service (IHS) survey conducted in Alaska showed that almost as many Alaskan school-aged girls are using smokeless tobacco products as school-aged boys. Data were collected in the spring of 1986 from voluntary respondents, both Alaskan Natives and non-Natives, in eight rural regions of Alaska. A nine-question, self-administered survey was distributed by IHS dental staff to students in grades K-12 who had volunteered to participate in the survey. The number of girls and boys responding was 2,454 and 2,511, respectively; they ranged from 5 to 18 years of age. Results indicated that 27.5% of girls and 33.7% of boys who responded use smokeless tobacco products (Table 2). A user

TABLE 2. Percentage of girls and boys reporting use of smokeless tobacco products, by age—Alaska, 1986

Age	Girls		Boys	
	No.	(%)	No.	(%)
5	59	16.9	61	9.8
6	130	12.3	148	16.9
7	161	13.0	183	14.8
8	168	14.9	166	19.3
9	177	22.6	166	27.7
10	204	26.5	190	26.8
11	182	31.9	222	30.2
12	226	25.7	210	31.4
13	222	37.8	208	36.5
14	220	33.6	203	39.4
15	216	30.6	223	47.5
16	228	36.4	201	52.7
17	175	30.9	199	47.2
18	86	36.0	131	48.9
All respondents	2,454	27.5	2,511	33.7

Smokeless Tobacco — Continued

was defined as anyone who responded "yes" to the question, "Do you use smokeless tobacco products?" For 5-year-olds, 16.9% of girls and 9.8% of boys reported using smokeless tobacco products.

For girls, the duration of use for smokeless tobacco products ranged from 1.3 years for 5-year-olds to 7.9 years for 18-year-olds (Table 3). For boys, duration of use ranged from 1.0 year for 5-year-olds to 6.5 years for 18-year-olds. The average 18-year-old had been using smokeless tobacco for about 7.5 years.

The IHS survey did not question whether responding smokeless tobacco users used snuff or chewing tobacco. However, 84% of users indicated that they used a particular brand of snuff most often. On average, girls used 1.1 cans of snuff a week, and boys used 1.4 cans; there were no consistent age-specific trends (Table 4). In contrast, data from the Inspector

TABLE 3. Reported number of years using smokeless tobacco, by gender and age—Alaska, 1986

Age	Girls	Boys
5	1.3	1.0
6	1.5	1.5
7	2.1	2.0
8	1.9	1.9
9	2.7	2.3
10	2.7	3.1
11	3.4	3.1
12	3.6	3.2
13	3.2	4.3
14	3.8	4.6
15	5.2	4.9
16	5.5	5.2
17	5.1	5.7
18	7.9	6.5

TABLE 4. Reported number of cans of snuff used each week, by gender and age—Alaska, 1986

Age	Girls	Boys
5	0.5	1.5
6	0.9	0.9
7	0.9	0.9
8	1.1	2.1
9	1.3	1.4
10	0.9	1.5
11	1.1	1.6
12	1.2	1.1
13	1.0	1.1
14	1.3	1.3
15	1.1	1.5
16	1.2	1.7
17	0.9	1.4
18	0.9	1.6
All respondents	1.1	1.4

Smokeless Tobacco — Continued

General's survey conducted in 1985 revealed that smokeless tobacco users 11 to 19 years of age used an average of 2.9 cans of snuff per week (2). The most frequently reported level of snuff use was one can per week.

In the IHS survey, 43% of girls and 45% of boys who responded reported having tried smokeless tobacco. Sixty percent of respondents indicated that they were aware of health risks associated with smokeless tobacco use, and 93% of those respondents listed cancer as a possible health problem. The Inspector General's survey reported that 89% of users knew that smokeless tobacco can be harmful to health, and 79% reported oral cancer as a risk associated with smokeless tobacco use; 46% thought they were personally at risk for these adverse health effects (2).

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Editorial Note: *The Health Consequences of Using Smokeless Tobacco: A Report of the Advisory Committee to the Surgeon General* states that the highest rates of smokeless tobacco use in the United States are among teenage and young adult males (1). A report by the Office of the Inspector General and the Office of Analysis and Inspections of the U.S. Department of Health and Human Services, *Youth Use of Smokeless Tobacco: More Than a Pinch of Trouble*, also reports that smokeless tobacco users among youth are predominately white males (2). The prevalence of smokeless tobacco use among male adolescents as reported from regional and state surveys indicate usage rates as high as 30%-40% in some junior and senior high schools (3-8). A 1985 Dane County, Wisconsin, survey of students in grades 7-12 reported regular use of smokeless tobacco products from 9% of 7th-grade boys to 22% of 12th-grade boys (12).

Additional data indicate that smokeless tobacco use in AI/AN children is substantially higher than in the general population of the same age. Weekly smokeless tobacco use was reported by 34% of girls and 43% of boys from 144 AI/AN adolescents (mean age 12.3 years) from Alaska and Washington (9). Another survey reported weekly smokeless tobacco use of 27.4% for 135 American Indian girls and 20.2% for 119 boys (mean age 13.8 years) in Washington (10). Two surveys conducted by IHS in the 1984/85 school year in grades 4-8 at four schools on Pine Ridge Reservation, South Dakota, and at Browning Public School, Blackfoot Indian Reservation, Montana, indicated that 47% of boys and 45% of girls currently use smokeless tobacco products (11).

In order to deal with the potential health risks from smokeless tobacco use, the U.S. Congress passed the "Comprehensive Smokeless Tobacco Health Education Act of 1986," P.L. 99-252 on February 27, 1986. This act provides for the following:

1. Development and implementation of health education programs, materials, and public service announcements to inform the public of the health risks resulting from the use of smokeless tobacco products.
2. Public health education technical assistance concerning smokeless tobacco.
3. Research on the effects of smokeless tobacco on human health and the collection, analysis, and dissemination of information and studies on smokeless tobacco and health.
4. Health warning labels on all smokeless tobacco products and advertisements, except for outdoor billboards, effective February 27, 1987.
5. Banning of radio and television advertising, effective August 27, 1986.
6. Disclosure to the Secretary of Health and Human Services of the ingredients used in the production of smokeless tobacco as well as the quantity of nicotine in each such product by all manufacturers, packagers, and importers of smokeless tobacco.

Smokeless Tobacco — Continued

Data from the survey in Alaska, as well as other AI/AN surveys, report high usage rates for boys and girls and an early age of initiation for smokeless tobacco use. While P.L. 99-252 may have an impact on AI/AN children, it is important that primary prevention and cessation programs be developed and implemented for these special populations. A 5-year-old who uses smokeless tobacco until he or she is 18 years of age will be exposed to a number of health risk factors for 13 years. To be effective, smokeless tobacco intervention programs need to be implemented in preschool and kindergarten.

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Progress in Chronic Disease Prevention

Advancements in Meeting the 1990 Hypertension Objectives

Nine of the 226 health objectives for the nation published in 1980 deal with control of high blood pressure (1,2). A review of progress toward these goals indicates that Americans are increasingly recognizing the causes of hypertension; taking steps to identify it; and, to a great extent, managing it through medical care and changes in personal lifestyle (3,4). The net result of this is declining mortality from hypertension-mediated causes.

Three principal areas of concern expressed by the National Institutes of Health (NIH), the federal lead agency for hypertension control, include: 1) increasing the public's knowledge of high blood pressure and related sequelae, 2) encouraging adoption of behaviors conducive to high blood pressure control, and 3) implementing systems designed to improve surveillance and control methods. The hypertension objectives are a priority because improved high blood pressure control rates will result in reduced mortality from cardiovascular disease, especially stroke.

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TABLE I. Summary—cases specified notifiable diseases, United States

Disease	10th Week Ending			Cumulative 10th Week Ending		
	Mar. 14, 1987	Mar. 8, 1986	Median 1982-1986	Mar. 14, 1987	Mar. 8, 1986	Median 1982-1986
Acquired Immunodeficiency Syndrome (AIDS)	1,325	197	N	4,260	2,084	N
Asplenic meningitis	72	90	89	820	824	823
Encephalitis: Primary (arthropod-borne & unsp.)	11	13	18	136	162	163
Post-infectious	1	1	1	5	12	13
Gonorrhea: Civilian	14,248	13,942	16,194	157,115	157,990	157,990
Military	352	398	506	3,278	3,010	4,327
Hepatitis: Type A	575	437	456	4,493	4,376	4,376
Type B	485	521	521	4,404	4,505	4,448
Non A, Non B	64	74	N	510	591	N
Unspecified	60	110	127	634	1,007	1,007
Legionellosis	7	10	N	107	109	N
Leprosy	2	7	7	42	46	45
Malaria	9	23	16	125	129	127
Measles: Total*	110	70	66	388	611	238
Indigenous	103	53	N	309	576	N
Imported	7	16	N	79	33	N
Meningococcal infections: Total	105	83	84	735	633	633
Civilian	105	83	83	734	632	632
Military	-	-	-	1	1	1
Mumps	350	59	96	3,009	539	696
Parotitis	34	55	34	421	421	312
Rubella (German measles)	8	8	19	44	84	104
Syphilis (Primary & Secondary): Civilian	593	419	535	6,302	4,858	5,477
Military	3	5	2	46	44	58
Toxic Shock syndrome	3	7	N	51	51	N
Tuberculosis	406	404	491	3,358	3,345	3,591
Tularemia	2	3	2	16	13	17
Typhoid fever	6	7	7	34	42	64
Typhus fever: tick-borne (RMSF)	1	1	1	8	9	9
Rabies, animal	69	104	104	638	832	832

TABLE II. Notifiable diseases of low frequency, United States

	Cum 1987		Cum 1987
Anthrax	-	Leptospirosis	0
Botulism: Foodborne	1	Plague	1
Infant (Idaho 1)	10	Poliomyelitis, Paralytic	-
Other	-	Psittacosis (Mich. 1, Oreg. 3)	13
Brucellosis (Mo. 2)	13	Rabies, human	-
Cholera	-	Tetanus	4
Congenital rubella syndrome (Calif. 1)	2	Trichinosis (Ky. 1)	11
Congenital syphilis, ages < 1 year	-	Typhus fever, flea-borne (endemic, murine)	4
Diphtheria	2		

*Seven of the 110 reported cases for this week were imported from a foreign country or can be directly traceable to a known internationally imported case within two generations.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending
March 14, 1987 and March 8, 1986 (10th Week)

Reporting Area	AIDS	Aseptic Meningitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral, by type)				Legionel- losis	Leprosy
			Primary	Post-in- fectious			A	B	NA/NB	Unspeci- fied		
	Cum. 1987	1987	Cum. 1987	Cum. 1987	Cum. 1987	Cum. 1986	1987	1987	1987	1987	1987	Cum. 1987
UNITED STATES	4,280	72	136	5	157,115	157,990	575	495	64	60	7	42
NEW ENGLAND	171	3	8	1	5,792	3,463	13	40	5	9	1	1
Maine	7	-	-	-	192	167	-	9	-	-	-	-
NH	7	1	-	-	80	109	-	2	2	-	-	-
VT	2	-	2	-	38	58	-	-	1	-	-	-
Mass	101	1	3	-	2,154	1,417	5	21	1	9	1	1
RI	14	-	2	1	436	327	-	-	-	-	-	-
Conn	40	-	1	-	2,892	1,385	8	8	1	-	-	-
MID ATLANTIC	1,354	4	17	-	25,825	25,035	21	17	-	4	-	-
Upstate N.Y.	365	4	8	-	3,078	3,045	21	10	-	-	-	-
N.Y. City	752	-	3	-	14,805	14,322	-	7	-	4	-	-
NJ	177	-	1	-	3,108	2,943	-	-	-	-	-	-
Pa	60	U	5	-	4,834	4,725	U	U	U	U	U	-
E.N. CENTRAL	170	17	39	-	17,669	22,808	25	53	3	6	1	1
Ohio	24	2	20	-	4,890	5,305	3	12	1	-	1	1
Ind	23	-	1	-	1,859	2,769	-	9	-	2	-	-
Ill	56	9	7	-	2,330	3,388	8	10	-	-	-	-
Mich	46	6	11	-	7,144	6,783	14	22	2	1	-	-
Wis	21	-	-	-	1,646	2,563	-	-	-	-	-	-
W.N. CENTRAL	88	4	4	-	6,565	7,239	10	27	3	-	2	-
Minn	18	-	1	-	1,054	1,029	3	-	-	2	1	-
Iowa	4	-	-	-	669	711	-	5	2	-	-	-
Mo	49	2	-	-	3,369	3,401	3	18	1	-	-	-
N. Dak	-	-	-	-	71	72	-	-	-	-	-	-
S. Dak	1	-	-	-	134	126	-	-	-	-	-	-
Nebr	4	-	2	-	364	528	-	1	-	-	-	-
Kans	12	2	1	-	904	1,372	4	3	-	-	1	-
S ATLANTIC	597	12	24	1	41,790	39,131	35	64	8	3	2	2
Del	8	-	1	-	591	660	2	2	1	-	-	-
Md	93	1	1	-	4,845	4,739	6	13	2	-	-	2
D.C.	71	-	-	-	2,594	2,914	1	1	-	-	-	-
Va	29	4	10	1	3,331	3,502	10	4	-	-	-	-
W. Va	2	-	5	-	336	453	-	1	-	-	-	-
N.C.	27	1	6	-	5,990	5,910	2	3	1	-	-	-
S.C.	8	-	-	-	3,887	3,593	-	9	1	-	-	-
Ga	81	-	-	-	7,193	6,862	7	10	-	-	1	-
Fla	278	6	1	-	13,023	10,678	8	21	3	3	1	-
E.S. CENTRAL	11	1	6	2	11,727	13,362	9	20	2	-	-	-
Ky	4	-	2	1	1,200	1,569	-	1	-	-	-	-
Tenn	-	-	2	-	4,048	5,277	1	9	2	-	-	-
Ala	3	1	2	-	3,781	3,579	7	8	-	-	-	-
Miss	4	-	-	1	2,698	2,937	1	2	-	-	-	-
W.S. CENTRAL	354	13	12	1	17,608	19,686	65	45	6	16	1	4
Ark	11	-	-	1	1,806	1,790	3	1	-	-	-	-
La	57	-	2	-	3,921	3,499	3	5	1	-	-	-
Okla	16	-	4	-	1,904	2,304	14	6	2	1	1	-
Tex	270	13	6	-	9,977	12,093	45	33	3	15	-	4
MOUNTAIN	98	4	5	-	4,226	4,586	100	61	5	6	-	-
Mont	1	-	-	-	102	123	3	1	-	1	-	-
Idaho	2	-	-	-	147	169	3	2	-	-	-	-
Wyo	2	-	-	-	66	114	1	-	-	-	-	-
Colo	44	-	1	-	879	1,312	6	11	-	3	-	-
N. Mex	10	-	-	-	646	521	4	3	-	-	-	-
Ariz	13	1	3	-	1,482	1,271	79	39	5	1	-	-
Utah	8	3	-	-	177	223	2	-	-	1	-	-
Nev	18	-	-	-	927	853	3	6	-	-	-	-
PACIFIC	1,417	14	21	-	25,913	22,690	297	158	32	16	-	34
Wash	44	-	3	-	1,533	1,903	114	59	6	8	-	2
Oreg	13	-	-	-	863	861	29	18	-	-	-	-
Calif	1,342	13	18	-	22,825	19,001	142	82	20	8	-	30
Alaska	3	1	-	-	434	657	11	1	-	-	-	-
Hawaii	15	-	-	-	238	258	1	-	-	-	-	2
Guam	-	-	-	-	47	6	-	-	-	-	-	-
PR	-	-	-	-	439	453	6	12	1	-	-	-
VI	-	-	-	-	44	43	-	-	-	-	-	-
Pac. Trust Terr	-	-	-	-	66	4	-	-	-	-	-	6
Amer Samoa	-	U	-	-	23	7	U	U	U	U	U	-

N: Not notifiable

U: Unavailable

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending
March 14, 1987 and March 8, 1986 (10th Week)

Reporting Area	Malaria		Measles (Rubeola)				Meningococcal Infections	Mumps		Pertussis			Rubella		
			Indigenous		Imported *										
	Cum. 1987	1987	Cum. 1987	1987	Cum. 1987	Cum. 1986	Cum. 1987	1987	Cum. 1987	1987	Cum. 1987	Cum. 1986	1987	Cum. 1987	Cum. 1986
UNITED STATES	125	103	309	7	79	611	735	350	3,009	34	335	421	8	44	84
NEW ENGLAND	11	-	1	-	5	9	69	-	9	1	7	26	-	-	1
Maine	-	-	-	-	-	-	4	-	-	-	-	2	-	-	-
N.H.	-	-	-	-	-	-	7	-	6	-	1	9	-	-	1
Vt.	-	-	1	-	5	-	6	-	1	1	2	1	-	-	-
Mass.	6	-	-	-	-	9	34	-	1	-	3	8	-	-	-
R.I.	4	-	-	-	-	-	7	-	-	-	-	1	-	-	-
Conn.	1	-	-	-	-	-	11	-	1	-	1	5	-	-	-
MID ATLANTIC	7	7	48	2	30	184	51	3	47	1	33	80	-	-	20
Upstate N.Y.	3	-	4	-	8	3	32	1	18	1	24	38	-	-	14
N.Y. City	1	7	42	2†	6	18	3	-	-	-	-	3	-	-	6
N.J.	1	-	-	-	1	163	-	2	16	-	1	5	-	-	1
Pa.	2	U	-	U	15	-	16	U	16	U	8	14	U	-	-
E.N. CENTRAL	2	2	28	-	4	150	103	120	1,941	3	48	109	1	7	5
Ohio	2	-	-	-	4	-	37	-	32	-	19	45	-	-	-
Ind.	-	-	-	-	-	-	11	-	211	-	-	9	-	-	-
Ill.	-	1	5	-	-	80	17	51	1,053	-	3	16	1	6	2
Mich.	-	1	23	-	-	-	34	67	346	3	13	11	-	1	2
Wis.	-	-	-	-	-	68	4	2	299	-	11	28	-	-	1
W.N. CENTRAL	4	1	1	-	1	48	40	80	235	-	23	28	-	-	4
Minn.	3	-	-	-	-	-	11	52	120	-	3	12	-	-	-
Iowa	-	-	-	-	-	-	3	26	84	-	2	4	-	-	-
Mo.	1	1	1	-	1	-	11	1	5	-	10	3	-	-	1
N. Dak.	-	-	-	-	-	-	1	-	-	-	1	2	-	-	-
S. Dak.	-	-	-	-	-	-	1	-	10	-	1	-	-	-	-
Nebr.	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-
Kans.	-	-	-	-	-	48	12	1	16	-	6	6	-	-	3
S. ATLANTIC	18	-	-	-	-	74	129	1	26	12	88	82	3	5	1
Del.	1	-	-	-	-	-	3	-	-	-	-	3	-	-	-
Md.	3	-	-	-	-	4	13	-	6	-	-	19	1	1	-
D.C.	3	-	-	-	-	-	3	-	-	-	-	6	-	-	-
Va.	3	-	-	-	-	-	25	-	1	1	28	6	-	-	-
W. Va.	-	-	-	-	-	-	-	-	6	1	20	1	-	-	-
N.C.	3	-	-	-	-	-	14	-	2	9	34	11	-	-	-
S.C.	-	-	-	-	-	58	8	-	1	-	-	2	-	-	-
Ge.	2	-	-	-	-	1	27	-	1	1	5	28	-	-	-
Fla.	3	-	-	-	-	11	36	1	9	-	1	12	2	4	1
E.S. CENTRAL	1	-	-	-	-	-	35	85	480	-	6	11	-	2	1
Ky.	-	-	-	-	-	-	5	9	110	-	1	1	-	2	-
Tenn.	-	-	-	-	-	-	16	78	369	-	-	2	-	-	-
Ala.	-	-	-	-	-	-	10	-	1	-	3	8	-	-	-
Miss.	1	-	-	-	-	-	4	-	-	-	2	-	-	-	-
W.S. CENTRAL	8	3	5	-	1	41	60	29	120	8	23	18	-	-	13
Ark.	1	-	-	-	-	21	2	4	11	1	2	-	-	-	-
La.	-	-	-	-	-	-	6	11	41	-	2	2	-	-	-
Okla.	2	-	-	-	1	-	10	N	N	7	19	16	-	-	-
Tex.	5	3	5	-	-	20	42	14	68	-	-	-	-	-	13
MOUNTAIN	4	10	22	2†	12	38	21	19	89	2	26	50	-	1	-
Mont.	-	-	-	2†	2	1	-	-	-	-	-	-	-	-	-
Idaho	1	-	-	-	-	-	1	-	1	-	11	13	-	-	-
Wyo.	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
Colo.	-	-	-	-	-	2	6	-	7	2	11	10	-	-	-
N. Mex.	-	10	22	-	9	13	1	N	N	-	1	7	-	-	-
Ariz.	1	-	-	-	1	20	11	19	56	-	-	19	-	-	-
Utah	-	-	-	-	-	-	-	-	4	-	1	1	-	1	-
Nev.	2	-	-	-	-	-	2	-	1	-	-	-	-	-	-
PACIFIC	70	80	208	3	26	69	227	13	82	7	83	37	4	29	39
Wash.	3	-	-	-	-	22	31	5	13	1	14	16	-	-	-
Oreg.	1	-	1	-	20	-	10	N	N	-	9	2	-	1	-
Calif.	64	80	206	3†	5	39	182	5	60	-	40	17	4	26	39
Alaska	2	-	-	-	-	-	2	2	3	-	2	1	-	-	-
Hawaii	-	-	-	-	1	6	2	1	6	6	18	1	-	2	-
Guam	-	-	1	-	-	-	2	-	3	-	-	-	-	-	1
P.R.	-	139	139	-	-	4	1	-	1	3	8	2	-	1	-
V.I.	-	-	-	-	-	-	-	1	2	-	-	-	-	-	-
Pac. Trust Terr.	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
Amer. Samoa	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-

*For measles only, imported cases includes both out-of-state and international importations.

N Not notifiable U Unavailable † International ‡ Out-of-state

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending
March 14, 1987 and March 8, 1986 (10th Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic- shock Syndrome	Tuberculosis		Tula- ræmia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum 1987	Cum 1986	1987	Cum 1987	Cum 1986	Cum 1987	Cum 1987	Cum 1987	Cum 1987
UNITED STATES	6,302	4,858	3	3,358	3,345	16	34	8	638
NEW ENGLAND	93	110	-	81	108	-	2	-	-
Maine	-	7	-	10	12	-	-	-	-
NH	1	5	-	3	7	-	-	-	-
VT	1	4	-	1	6	-	-	-	-
Mass	51	58	-	21	50	-	2	-	-
RI	-	5	-	7	5	-	-	-	-
Conn	40	31	-	39	28	-	-	-	-
MID ATLANTIC	959	857	-	808	848	-	5	-	75
Upstate NY	31	31	-	116	94	-	2	-	8
NY City	875	366	-	284	300	-	-	-	-
NJ	112	137	-	106	124	-	3	-	1
Pa	141	123	U	100	128	-	-	-	60
E N CENTRAL	96	160	1	448	457	1	8	-	15
Ohio	16	17	1	89	72	1	3	-	-
Ind	14	25	-	32	53	-	1	-	-
Ill	35	78	-	170	206	-	1	-	9
Mich	24	27	-	143	100	-	2	-	-
Wis	7	13	-	12	26	-	1	-	6
W N CENTRAL	31	81	-	100	82	5	3	-	136
Minn	4	8	-	21	17	-	1	-	39
Iowa	5	4	-	8	11	2	-	-	41
Mo	17	25	-	56	43	3	2	-	6
N Dak	-	2	-	1	2	-	-	-	17
S Dak	2	-	-	3	2	-	-	-	22
Nebr	2	7	-	3	3	-	-	-	2
Kans	1	5	-	8	4	-	-	-	9
S ATLANTIC	2,064	1,419	2	671	680	2	5	1	170
Del	19	8	-	2	7	1	-	-	-
Md	123	84	-	59	45	-	-	-	37
D C	65	77	-	23	30	-	-	-	11
Va	47	98	-	71	52	1	-	-	60
W Va	1	3	-	25	25	-	1	-	12
NC	130	115	-	68	68	-	1	-	-
S C	129	148	1	69	84	-	-	1	5
Ga	335	256	-	69	79	-	-	-	33
Fla	1,215	630	1	285	249	-	3	-	12
E S CENTRAL	420	320	-	260	307	2	1	3	34
Ky	3	21	-	88	74	1	-	-	23
Tenn	205	150	-	-	81	-	1	2	-
Ala	98	105	-	113	116	-	-	-	11
Miss	114	44	-	59	26	1	-	1	-
W S CENTRAL	887	1,049	-	347	407	5	2	3	92
Ark	37	47	-	28	27	1	-	-	25
La	148	173	-	63	107	-	-	-	3
Okla	27	33	-	41	41	4	1	3	1
Tex	675	796	-	217	232	-	1	-	63
MOUNTAIN	128	135	-	85	70	1	1	-	39
Mont	7	2	-	6	2	-	-	-	19
Idaho	1	-	-	10	4	-	-	-	-
Wyo	-	-	-	-	-	-	-	-	12
Colo	22	38	-	-	1	-	-	-	-
N Mex	11	17	-	18	19	-	1	-	-
Ariz	65	59	-	43	33	1	-	-	8
Utah	-	3	-	1	1	-	-	-	-
Nev	20	15	-	7	10	-	-	-	-
PACIFIC	1,628	957	-	762	808	-	7	1	77
Wash	12	25	-	31	33	-	-	-	-
Oreg	35	22	-	19	28	-	-	-	-
Calif	1,578	900	-	653	503	-	6	1	76
Alaska	2	-	-	18	12	-	-	-	1
Hawaii	1	10	-	41	32	-	1	-	-
Guam	1	1	-	2	-	-	-	-	-
PR	182	167	-	46	55	-	-	-	10
VI	2	-	-	1	-	-	-	-	-
Pac Trust Terr	37	-	-	17	3	-	3	-	-
Amer Samoa	-	-	U	-	-	-	-	-	-

U Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending
March 14, 1987 (10th Week)

Reporting Area	All Causes, By Age (Years)						P&I [†] Total	Reporting Area	All Causes, By Age (Years)						P&I [†] Total
	All Ages	≥85	45-64	25-44	1-24	<1			All Ages	≥85	45-64	25-44	1-24	<1	
NEW ENGLAND	695	502	117	42	14	20	68	S ATLANTIC	1,212	757	250	106	41	42	66
Boston, Mass. §	182	124	35	11	6	20	20	Atlanta, Ga.	158	96	32	14	4	12	5
Bridgeport, Conn.	46	32	8	3	2	1	1	Baltimore, Md.	118	73	27	15	-	3	6
Cambridge, Mass.	30	22	5	3	-	-	-	Charlotte, N.C.	68	39	18	5	6	-	9
Fall River, Mass.	36	27	5	3	1	-	2	Jacksonville, Fla.	112	68	27	7	7	3	3
Hartford, Conn.	62	41	10	7	-	4	3	Miami, Fla.	110	45	33	18	8	6	1
Lowell, Mass.	25	19	6	-	-	1	1	Norfolk, Va.	66	44	2	1	4	2	4
Lynn, Mass.	22	17	6	-	-	-	1	Richmond, Va.	97	69	21	5	1	1	8
New Bedford, Mass.	22	19	3	-	-	-	2	Savannah, Ga.	55	42	10	1	-	2	10
New Haven, Conn.	45	31	9	2	-	3	1	St. Petersburg, Fla.	62	53	5	2	1	1	3
Providence, R.I.	83	66	10	2	1	4	14	Tampa, Fla.	99	59	22	7	1	-	5
Somerville, Mass.	6	4	-	1	1	-	-	Washington, D.C.	238	138	48	26	9	12	10
Springfield, Mass.	52	39	7	3	1	2	6	Wilmington, Del.	41	31	5	5	-	-	-
Waterbury, Conn.	31	24	6	1	-	-	3								
Worcester, Mass.	53	37	8	6	2	-	4								
MID ATLANTIC	2,901	1,894	610	270	56	71	178	E.S. CENTRAL	768	498	175	59	15	21	41
Albany, N.Y.	98	51	7	6	1	3	1	Birmingham, Ala.	138	77	36	11	6	-	3
Allentown, Pa.	25	21	3	-	-	-	2	Chattanooga, Tenn.	80	44	14	1	1	-	5
Buffalo, N.Y.	128	83	31	6	5	4	11	Cincinnati, Ohio	82	56	19	6	-	2	6
Camden, N.J.	39	22	13	1	1	2	-	Louisville, Ky.	122	82	25	10	1	4	6
Elizabeth, N.J.	21	13	7	1	-	-	4	Memphis, Tenn.	122	83	29	7	1	2	9
Ena, Pa. †	45	34	6	4	1	-	4	Mobile, Ala.	74	50	12	11	1	-	3
Jersey City, N.J.	40	23	6	8	3	-	2	Montgomery, Ala.	47	24	17	3	-	3	1
N.Y. City, N.Y.	1,444	908	303	179	22	32	64	Nashville, Tenn.	123	82	23	11	5	2	8
Newark, N.J.	72	36	17	14	3	3	10								
Paterson, N.J.	42	27	8	5	-	2	2	W.S. CENTRAL	1,384	890	292	118	42	52	65
Philadelphia, Pa.	494	332	106	26	15	32	32	Austin, Tex.	59	33	14	8	1	3	2
Pittsburgh, Pa. †	56	37	13	4	-	2	3	Baton Rouge, La.	44	28	11	2	1	2	6
Reading, Pa.	36	20	11	4	-	-	2	Corpus Christi, Tex.	54	38	11	2	2	1	5
Rochester, N.Y.	104	78	19	3	2	16	16	Dallas, Tex.	196	120	37	23	9	7	4
Schenectady, N.Y.	31	16	11	4	-	1	1	El Paso, Tex.	68	53	11	2	1	1	1
Scranton, Pa. †	28	22	6	-	-	2	2	Fort Worth, Tex.	91	59	14	9	5	4	5
Syracuse, N.Y.	137	100	31	2	1	3	17	Houston, Tex. §	307	175	74	34	13	11	7
Trenton, N.J.	34	30	3	-	-	1	-	Little Rock, Ark.	58	37	14	2	1	4	7
Utica, N.Y.	20	14	3	-	1	2	2	New Orleans, La.	110	69	27	8	2	4	1
Yonkers, N.Y.	37	28	6	3	-	-	3	San Antonio, Tex.	231	153	47	17	3	11	17
								Shreveport, La.	79	57	13	5	2	2	9
								Tulsa, Okla.	87	58	19	6	2	2	3
E.M. CENTRAL	2,342	1,542	509	167	61	63	98	MOUNTAIN	730	493	147	51	15	24	55
Akron, Ohio	74	53	12	6	2	1	-	Albuquerque, N.Mex.	96	68	18	7	2	1	14
Canton, Ohio	37	28	7	2	-	-	3	Colorado Springs, Colo.	42	29	9	2	-	2	7
Chicago, Ill. §	564	362	125	45	10	22	16	Denver, Colo.	134	75	31	15	4	9	4
Cincinnati, Ohio	163	112	30	17	3	1	21	Las Vegas, Nev.	83	52	21	6	2	2	10
Cleveland, Ohio	178	111	45	12	6	4	2	Ogden, Utah	24	18	4	1	-	3	3
Columbus, Ohio	128	72	35	11	4	6	2	Phoenix, Ariz.	139	89	34	9	-	7	6
Dayton, Ohio	102	67	25	6	3	1	1	Pueblo, Colo.	25	24	1	-	-	-	2
Detroit, Mich.	261	137	70	26	18	10	2	Salt Lake City, Utah	55	33	12	2	5	3	2
Evansville, Ind.	56	37	13	4	1	1	1	Tucson, Ariz.	132	105	17	9	1	-	7
Fort Wayne, Ind.	63	47	13	-	2	1	5								
Gary, Ind.	17	11	4	-	2	-	-	PACIFIC	2,193	1,453	420	185	62	59	140
Grand Rapids, Mich.	58	39	13	4	1	1	9	Berkeley, Calif.	26	18	5	2	-	1	3
Indianapolis, Ind.	156	108	31	9	4	4	4	Fresno, Calif.	112	84	19	7	1	1	9
Madison, Wis.	40	30	4	3	-	3	5	Glendale, Calif.	32	24	8	-	-	-	1
Milwaukee, Wis.	128	96	24	5	1	2	7	Honolulu, Hawaii	80	49	18	4	9	-	9
Peoria, Ill.	39	30	5	3	1	2	6	Long Beach, Calif.	85	52	17	8	2	6	11
Rockford, Ill.	55	39	9	3	1	6	1	Los Angeles, Calif.	641	420	125	56	17	10	27
South Bend, Ind.	31	25	5	1	-	1	1	Oakland, Calif.	88	54	15	12	3	4	3
Toledo, Ohio	122	93	21	4	1	3	9	Pasadena, Calif.	30	22	2	2	-	4	1
Youngstown, Ohio	70	45	18	6	-	1	2	Portland, Ore.	134	95	17	12	4	6	10
								San Diego, Calif.	144	87	35	16	4	2	4
W.N. CENTRAL	794	551	170	30	23	19	64	Sacramento, Calif.	172	120	23	18	6	4	20
Des Moines, Iowa	68	48	15	2	2	1	5	San Francisco, Calif.	161	103	38	17	1	2	5
Duluth, Minn.	36	20	11	1	3	1	2	San Jose, Calif.	208	135	46	12	6	9	17
Kansas City, Kans.	29	18	9	1	-	1	1	Seattle, Wash.	181	126	34	9	4	8	8
Kansas City, Mo.	116	85	23	2	2	4	8	Spokane, Wash.	55	39	9	3	3	1	9
Lincoln, Neb.	35	22	11	2	-	-	5	Tacoma, Wash.	44	28	9	7	2	1	3
Minneapolis, Minn.	83	62	13	3	3	2	7								
Omaha, Neb.	83	62	13	3	3	2	7								
St. Louis, Mo.	151	102	35	8	3	2	19								
St. Paul, Minn.	82	58	14	3	5	2	1								
Wichita, Kans.	75	48	18	3	3	3	11								
TOTAL	13,019 ^{††}	8,570	2,690	1,028	329	371	776								

* Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

^{††} Pneumonia and influenza.

† Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

†† Total includes unknown ages.

§ Data not available. Figures are estimates based on average of past 4 weeks.

Hypertension — Continued

In the past decade, awareness of hypertension has increased, and treatment and control have improved. There has also been a decline in stroke mortality. Table 5 presents data from the National Health and Nutrition Examination Surveys and data from the National Heart, Lung, and Blood Institute's Seven States Demonstration Projects (National Heart, Lung, and Blood Institute, unpublished data) (5,6). In the survey covering 1971-1972, 51% of persons with hypertension were aware of their condition. By the 1982-1984 survey, 85% of hypertensives were aware that they had high blood pressure. During this same period, the proportion of hypertensives under treatment increased from 36% to 74%. The prevalence rates of controlled hypertensives (<160/95mm Hg) rose from 16% for the period 1971-1972 to 57% for 1982-1984.

Evidence of progress in meeting a number of the nation's high blood pressure objectives by 1990 is available from probability surveys conducted by NIH and the National Center for Health Statistics (NCHS). These surveys were conducted in 1973, 1979, 1982, and 1985 and describe trends in the public's knowledge of high blood pressure, heart disease, and stroke (7,8,9). For example, in 1973, 29% of respondents who were asked an open-ended question on the consequences of high blood pressure stated that high blood pressure causes stroke. This percentage rose to 38% in 1979 and to 59% by 1982. Likewise, in 1973 only 24% of respondents stated that high blood pressure leads to heart disease; in 1979 the percentage was 37%; and by 1982 it had increased to 71%. In 1985, the health promotion/disease prevention portion of NCHS's National Health Interview Survey showed 77% of the general public regarded high blood pressure as the major condition that predisposes a person to having a stroke (9). Ninety-one percent of respondents indicated that high blood pressure increases a person's chances of experiencing heart disease. Since the first of these surveys was conducted, many government agencies, professional societies, and voluntary organizations have worked together to provide public education programs on the consequences of uncontrolled hypertension.

Reducing salt consumption is an important control method for hypertensives. From 1972 to 1985, there was a steady decline (36%) in food-grade salt sales. In 1972, consumers purchased an average of 2.25 pounds of salt per person; by 1985, sales averaged 1.44 pounds per person (The Salt Institute, unpublished data).

TABLE 5. Results of surveys of prevalence*, awareness†, treatment§, and control¶ rates of hypertension

Survey years	Prevalence (%)	Awareness (%)	Treatment (%)	Control (%)
1971-1972**	18	51	36	16
1974-1975**	22	64	34	20
1976-1980††	18	73	56	34
1982-1984§§	19	85	74	57

*Population with blood pressure $\geq 160/95$ mm Hg or on medication.

†Hypertensives informed by physician.

§Hypertensives on medication.

¶Hypertensives with blood pressure < 160/95mm Hg and on medication.

**Data are for persons 25-74 years of age.

††Data are for persons 18-74 years of age.

§§Data are for persons ≥ 18 years of age.

Hypertension — Continued

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Editorial Note: Stroke remains the third leading cause of death in this country; 152,710 Americans died in 1985 from this condition alone (10). Black Americans continue to have more hypertension than their white counterparts, and increased efforts to control hypertension are needed in this population. Awareness of the consequences of uncontrolled hypertension has increased since the 1971-1972 survey; however, compliance with medical regimens must increase, and there must be persistent efforts to get hypertensives to stay on therapy. Therefore, education strategies must shift from awareness of the disease to skill building, which will promote continued therapy. In addition, there is a need for patient tracking systems that will help health care providers identify persons whose hypertension is not under control.

While the challenges are formidable, there is evidence that current efforts have been effective. The decline in age-adjusted stroke mortality began to accelerate in 1972, the year the National High Blood Pressure Education Program (NHBPEP) began. If the expected mortality rates of 1960 to 1972 had prevailed until 1985, approximately 77,500 more Americans would have died from stroke in 1984 alone (National Heart, Lung, and Blood Institute, unpublished data).

The National Heart, Lung, and Blood Institute has led the efforts to coordinate the many agencies and programs comprising the NHBPEP. The NHBPEP Coordinating Committee has developed a variety of consensus reports that have led policy makers to develop blood pressure control programs. During 1986, NHBPEP prepared reports on blood pressure levels in children, management of hypertension in the elderly, and management of the hypertensive patient who also has diabetes. CDC is developing new program objectives for chronic diseases and working with state health departments. These activities should assist in meeting the national objectives to control hypertension. NCHS continues to provide invaluable data from their National Health Interview Surveys and National Health and Nutrition Examination Surveys. The Food and Drug Administration's regulation of sodium labeling for processed foods as well as their studies on food labeling and packaging have been helpful in monitoring progress on hypertension and sodium awareness. The Health Resources and Services Administration has been delivering essential medical care to the underserved through continued support of state health care activities and through primary care programs for Indians, migrants, and populations served by neighborhood health centers. The Office of Disease Prevention and Health Promotion of the Public Health Service has coordinated the development and progress reviews of the national health objectives, which have become important milestones in improving the nation's health. Continued diligence by both public and private organizations will help to assure that, by 1990, the nation's hypertension objectives will have been largely met.

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Hypertension — Continued

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*Epidemiologic Notes and Reports***Mumps — United States, 1985-1986**

In 1985, 2,982 cases of mumps were reported in the United States, representing an annual incidence rate of 1.2 cases/100,000 population (Table 6). This was 1.3% lower than the 1984 total of 3,021 cases and was an all-time low in reported mumps cases. It represented a 98% decrease from the peak of 152,209 cases reported in 1968, the year mumps became a nationally notifiable disease and the first year after mumps vaccine licensure, in December 1967.

TABLE 6. Age distribution of patients with reported mumps cases and estimated incidence rates* — United States, 1983-1985

Age group (yrs.)	1983			1984			1985			Rate change (%) 1983-1985
	No.	(%)	Rate*	No.	(%)	Rate*	No.	(%)	Rate*	
<1	16	(0.8)	0.7	37	(1.4)	1.2	29	(1.1)	0.9	+28.6
1-4	317	(15.3)	3.7	364	(13.7)	2.9	339	(13.1)	2.7	-27.0
5-9	708	(34.1)	7.2	842	(31.7)	5.9	837	(32.5)	5.7	-20.8
10-14	535	(25.8)	4.9	771	(29.1)	5.0	649	(25.2)	4.4	-10.2
15-19	249	(12.0)	2.1	335	(12.6)	2.0	405	(15.7)	2.4	+14.3
≥20	249	(12.0)	0.2	305	(11.5)	0.2	320	(12.4)	0.2	0.0
Total known age	2,074	(61.8)	—	2,654	(87.9)	—	2,579	(86.5)	—	—
Total unknown age	1,281	(38.2)	—	367	(12.1)	—	403	(13.5)	—	—
Total	3,355	(100.0)	1.4	3,021	(100.0)	1.3	2,982	(100.0)	1.2	-47.8

*Cases/100,000 population (projected census data) extrapolated from the age distribution of patients with known age to total cases. Not adjusted for states not reporting mumps: 1983—Florida, New Mexico, Oklahoma, Oregon; 1984 and 1985—New Mexico, Oklahoma, Oregon.

Mumps — Continued

Provisionally, 23 of the 47 states where mumps is a notifiable disease* reported more mumps cases in 1986 than in 1985. Maine and Wyoming reported no mumps cases. By comparison, in 1985, 16 states reported more mumps cases than in 1984, and two states (Louisiana and South Dakota) reported no mumps cases. Mumps cases were reported from 22.8% of 2,982 reporting counties in 1985, as compared with 23.3% of reporting counties in 1984. Age and county data are not yet available for 1986.

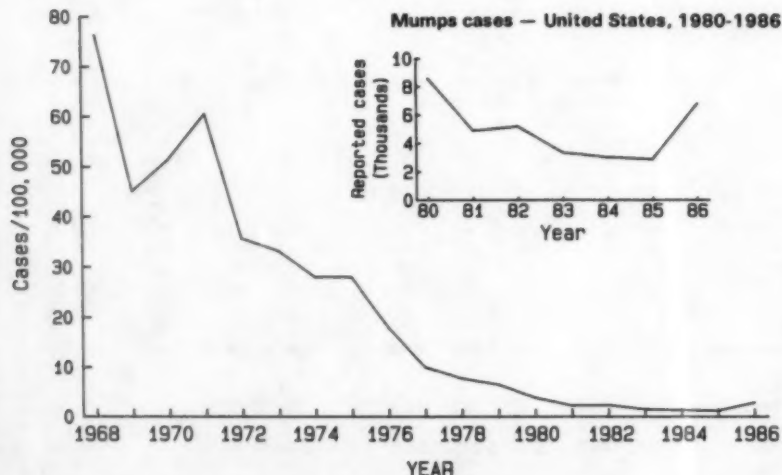
Illinois (2,743 cases, 23.7/100,000) and Tennessee (1,174 cases, 24.4/100,000) accounted for more than one-half of all mumps cases provisionally reported in 1986. Illinois and Tennessee are two of 16 reporting states without laws requiring mumps immunization for school entry or attendance. Although these 16 states comprise less than one-fourth of the U.S. population, they accounted for more than two-thirds of reported mumps cases.

National age-specific data are available for 2,579 (86.5%) of the persons with mumps cases reported for 1985 (Table 6). As in the prevaccine era, persons under 15 years of age continued to have the highest reported incidence rate (4.1 cases/100,000 population) (7). In contrast, the rate for persons 15 years of age or older was 0.4/100,000. Mumps patients 5-19 years of age accounted for 73.3% of persons of known age reported in 1985.

Long-term age-specific data on mumps patients are available from three reporting areas (California, Massachusetts, and New York City) that have been continually collecting such data since the time of vaccine licensure (Table 7). In the decade immediately following vaccine licensure (1967-1976), 5- to 9-year-olds had the highest reported incidence rate; children

*Mumps is not notifiable in New Mexico, Oklahoma, and Oregon.

FIGURE 1. Mumps incidence rates — United States, 1968-1986*



*1986 provisional data.

Mumps — Continued

under 5 had the second highest rate. Together, these two groups accounted for over 70% of all reported cases. Over the last 5 years (1981-1985), these two age groups accounted for slightly more than 50% of reported cases. Although the proportion of cases occurring in older persons has been increasing, their risk of disease has markedly decreased. Compared with the risk of acquiring mumps at the beginning of the vaccine era (1967-1971), the risk during the period 1981-1985 decreased at least 90% for all age groups.

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Editorial Note: The incidence of mumps reported in the United States increased in 1986 after 15 years of almost continual decline (Figure 1). Although age-specific data for 1986 are not yet available, reports from Illinois, Tennessee, and several other states suggest that the increased mumps activity was largely a result of illness in unvaccinated middle and high school students. The age-specific changes in mumps epidemiology observed since vaccine licensure are similar to those noted for measles and rubella and reflect a vaccination policy oriented toward preschool and elementary schoolchildren (2).

Persons who were neither vaccinated nor infected at a young age may be exposed when they are older and at higher risk for mumps-associated complications. This group now accounts for the majority of reported cases. The pool of susceptible persons remaining among older school-aged children and young adults has the potential for allowing continued transmission in middle and high schools and, eventually, in colleges and places of employment. Available data suggest that mumps outbreaks among unvaccinated cohorts will continue. This was evidenced by the outbreaks among middle and high school students in Ohio in 1982 (3,4) and New Jersey in 1983 (5). In September 1984, Ohio passed a law requiring mumps immunization for children in kindergarten through grade 12 (K-12), and, with gradual enforcement of the law, has reduced reported mumps substantially (6). In response to the 1986 outbreak, Illinois has recently enacted a K-12 law and will require all students to be in compliance as of fall 1987.

The effectiveness of mumps school immunization laws in decreasing mumps incidence has been consistently demonstrated (1,4-8). Sixteen of the 47 states reporting mumps cur-

TABLE 7. Age distribution of patients with reported mumps cases and estimated incidence rates* — California, Massachusetts, and New York City, 1967-1971,† 1972-1976,‡ and 1981-1985§

Age group (yrs.)	1967-1971§			1972-1976			1981-1985§			Rate change (%) 1967-1985
	No.	(%)	Rate*	No.	(%)	Rate*	No.	(%)	Rate*	
<5	2,932	(17.1)	102.5	1,125	(18.7)	41.2	92	(19.9)	5.1	-95.0
5-9	10,413	(60.8)	336.8	3,272	(54.3)	105.8	144	(31.1)	9.2	-97.3
10-14	2,372	(13.8)	75.5	992	(16.5)	31.6	98	(21.2)	3.7	-95.1
≥15	1,418	(8.3)	5.8	633	(10.5)	2.6	129	(27.9)	0.4	-93.1
Total	17,135	(100.0)	51.1	6,022	(100.0)	18.0	463	(100.0)	1.2	-97.7

*Reported number of cases/100,000 population. Cases of unknown age excluded.

†Average annual figure over 5-year period.

§Represents prevaccine years.

¶These selected data accurately reflect changes using total U.S. data; 1983 population projections used.

Mumps — Continued

rently do not require proof of mumps immunity for school entry (Table 8). Of the 31 states that do require mumps immunization, 11 have laws that affect only initial entry into school; six have laws that affect children beyond first grade but do not comprehensively include grades K-12; and 14 require proof of mumps immunity for all students in grades K-12. In 1985, the incidence rate of mumps in states with no law was twice that of states with a comprehensive K-12 school law. In 1986, the rate was 12-fold higher in states without a law and 2.6-fold higher if Illinois and Tennessee are excluded from the analysis because of their unusually high incidence of mumps. Of note, the reported mumps incidence rate during 1985 and 1986 in states with only a "partial law" (i.e., a school entry law or other law not comprehensively including grades K-12) was no different than that in states with no school law (again excluding Illinois and Tennessee for 1986).

Before the routine use of measles-mumps-rubella (MMR) vaccine in recent years, mumps immunization levels were considerably lower than measles or rubella immunization levels. This was partly because of the relatively high cost of mumps vaccine compared with the cost of either measles or rubella vaccines. In addition, mumps has never been given the same priority as measles or rubella in the public or medical community, despite the morbidity due to mumps and the fact that mumps virus was a leading cause of acquired deafness in the pre-vaccine era and the leading cause of viral encephalitis of known etiology in the United States until 1975 (7). Mumps vaccine was not recommended for routine use in all susceptible children until December 1977 (9). Nevertheless, mumps vaccine has been consistently shown to be highly cost-beneficial (10,11) and to be safe and effective, with reported clinical efficacy in the range of 75%-90% (2,12,13).

Children and adults lacking adequate documentation of physician-diagnosed mumps or vaccination with live mumps vaccine on or after their first birthday should receive mumps vaccine. It is especially important that susceptible adults be vaccinated because of the increased risk of mumps-associated complications (7). MMR is the vaccine of choice in recipients likely to be susceptible to measles and/or rubella as well as to mumps. There is no increased risk associated with vaccinating persons who may already be immune.

Future policy emphasis should include enforcing existing laws requiring vaccination against mumps, extending present laws to comprehensive K-12 coverage, and considering

TABLE 8. Reported mumps incidence among states with and without mumps immunization school laws — United States, 1985-1986

Mumps school law status	1985			1986		
	Number of states	Population	Rate*	Number of states	Population	Rate*
No law	17 (15) [†]	65,807,000 (49,302,000)	1.57 (1.46)	16 (14) [†]	55,263,000 (38,907,000)	8.33 (1.76)
Partial law [§]	17	96,958,000	1.49	17	98,268,000	1.68
Comprehensive K-12 law	13+DC	68,729,000	0.73	14+DC	80,065,000	0.69
Total	47+DC	231,294,000	1.29	47+DC	233,596,000	2.91

*Cases/100,000 population.

[†]Excludes Illinois and Tennessee.

[§]Affecting some children but not comprehensively including kindergarten through grade 12 (K-12).

Mumps—Continued

the introduction of laws requiring vaccination for all students in grades K-12 in states without an existing law. The recommendation of the American College Health Association that all college health programs require documentation of previous mumps disease or vaccination for entering students should be followed (14).

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Erratum: Vol. 36, No. 9

- p. 131 The first full sentence on the page should read as follows: "Eighty-two percent of the ingestions took place in the child's home, and 14%, in a relative's home".

